Claims

1. A polymeric surfactant formed by the reaction of an oligomeric or polymeric substrate with at least one ethylenically unsaturated monomer, wherein the reaction is conducted in the presence of a type II photo initiator and by the action of actinic radiation.

2. A polymeric surfactant according to claim 1, which is an amphiphilic polymer.

3. A polymeric surfactant according to claim 1 or claim 2, which is water-soluble.

4. A polymeric surfactant according to any of claims 1 to 3, which is oil soluble.

5. A polymeric surfactant according to any of claims 1 to 4, which has a molecular weight below 100,000, preferably below 50,000.

6. A polymeric surfactant according to any of claims 1 to 5, in which the substrate is selected from the group consisting of polyalkylene oxides, polyalkylene glycols, (meth) acrylamide polymers, (meth) acrylic acid polymers (esters or salts thereof), polyvinyl alcohol, polyvinyl acetate, polyvinylpyrrolidone, polyethylenimine, polyesters, polyamides, sugars, polysaccharides, amino acids, proteins and inorganic substances containing abstractable hydrogen.

7. A polymeric surfactant according to any of claims 1 to 6, in which the monomer comprises any one of acrylic, vinylic and allylic monomers.

8. A polymeric surfactant according to any of claims 1 to 7, in which the monomer comprises any of the group consisting of (meth) acrylamides, N-vinyl pyrrolidone, hydroxy ethyl acrylate, (meth) acrylic acid or salts thereof, maleic acid or salts thereof, itaconic acid or salts thereof, 2-acrylamido-2-methyl propane sulfonic acid or salts thereof, vinyl sulfonic acid, allyl sulfonic acid, dialkyl amino alkyl (meth) acrylates or quaternary ammonium or acid addition salts thereof, dialkyl amino alkyl (meth) acrylamides or quaternary ammonium or acid addition salts thereof, diallyl dialkyl ammonium halide, styrenes, C1-30 alkyl (meth) acrylates and (meth) acrylonitrile.

9. A polymeric surfactant according to any of claims 1 to 8, in which the photoinitiator comprises one or more compounds selected from the group consisting of benzophenone, diaryl ketones, xanthones, thioxanthones, acridones, anthraquinones, diketones, 2-ketocoumarins, and imides.

10. A polymeric surfactant according to any of claims 1 to 9, in which the actinic radiation is selected from ultraviolet light, infrared light, and visible light.

11. A method of producing a polymeric surfactant comprising contacting an oligomeric or polymeric substrate with at least one ethylenically unsaturated monomer and a type II photo initiator to form a reaction mixture and wherein the reaction mixture is subject to actinic radiation to induce grafting of monomer onto the substrate and photo polymerisation to form a polymeric surfactant.

12. A method according to claim 11 in which the reaction mixture is dissolved or dispersed in a liquid medium.

13. A method according to claim 12 in which the liquid medium is selected from the group consisting of methanol, toluene, cyclohexane, acetonitrile, dimethylformamide and water.

14. A method according to any of claims 11 to 13 including the features of any of claims 2 to 10.

15. Use of a polymeric surfactant defined by any of claims 1 to 10 or obtainable by any of claims 11 to 14 for the purpose of stabilising an interface between phases in an emulsion or a dispersion.

16. A composition comprising a discontinuous phase distributed throughout a continuous phase comprising an interface between phases and in which a polymeric surfactant is located at the interface,
in which the polymeric surfactant is formed by the reaction of an oligomeric or polymeric substrate with at least one ethylenically unsaturated monomer, wherein the reaction is conducted in the presence of a type II photo initiator and by the action of actinic radiation.

17. A composition according to claim 16 in which the polymeric surfactant is defined by any of claims 2 to 10 or obtainable by the method of any of claims 11 to 14.

18. A composition according to claim 16 or claim 17 in which the continuous phase comprises a hydrocarbon or a water immiscible liquid.

19. A composition according to any of claims 16 to 18 in which the discontinuous phase is aqueous.

20. A composition according to claim 16 or claim 17 in which the continuous phase is aqueous.

21. A composition according to claim 16, claim 17 or claim 20 in which the discontinuous phase comprises a hydrocarbon or a water immiscible liquid.

22. A composition according to any of claims 16 to 21 in which the polymeric surfactant is preferentially dissolved in the continuous phase.

23. A composition according to any of claims 16 to 22 comprising a first polymeric surfactant and a second polymeric surfactant in which the first polymeric surfactant is preferentially dissolved in the continuous phase and a second polymeric surfactant is preferentially dissolved in the discontinuous phase.

24. A composition according to any of claims 16 to 23 in which the discontinuous phase comprises at least one ethylenically unsaturated monomer or a polymer formed from at least one ethylenically unsaturated monomer.

25. A composition according to any of claims 16 to 23 which is an aqueous emulsion paint.

26. A composition according to claim 25 in which the aqueous emulsion paint is an aqueous alkyd resin paint formulation in which the continuous phase is aqueous and the discontinuous phase comprises the alkyd resin.

27. A composition according to any of claims 16 to 26, which is an oil in water in oil emulsion.

28. A composition according to any of claims 16 to 26, which is a water in oil in water emulsion.

29. A composition according to any of claims 16 to 28 in which the discontinuous phase comprises a particulate solid.

30. A composition according to claim 29 in which the particulate solid is selected from the group consisting of calcium carbonate, titanium dioxide, kaolinite, swellable clays, barium sulphate and pigments.

31. A composition according to claim 29 or claim 30 which is selected from the group consisting of filler dispersions, microparticulate retention aid dispersions, drilling muds and pigment dispersions.

32. A method of making a composition according to any of claims 16 to 28, wherein composition is an emulsion, comprising dissolving or dispersing the polymeric surfactant, as defined by claims 1 to 10 or obtainable by the methods of claims 11 to 14, into a first liquid and mixing a second liquid, which is immiscible with the first liquid and then forming the emulsion.

33. A method of making a composition according to any of claims 16 to 31, wherein the composition is a dispersion, comprising dissolving or dispersing the polymeric surfactant, as defined by claims 1 to 10 or obtainable by the methods of claims 11 to 14, into a liquid continuous phase and mixing a particulate solid into the liquid continuous phase and then forming the dispersion.